DOCUMENT RESUME

ED 480 096 CG 032 553

AUTHOR	Tuckman, Bruce W.
TITLE	The "Strategies-for-Achievement" Approach for Teaching Study Skills.
PUB DATE	2003-08-00
NOTE	27p.; Paper presented at the Annual Conference of the American Psychological Association (111th, Toronto, ON, Canada, August 7-10, 2003).
PUB TYPE	Information Analyses (070) -- Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE	EDRS Price MF01/PC02 Plus Postage.
DESCRIPTORS	*Academic Achievement; College Students; Higher Education; *Learning Strategies; *Motivation Techniques; Outcomes of Education; *Program Effectiveness; School Holding Power; *Study Skills; Teaching Methods

ABSTRACT

An educational psychology-based "study skills" program called "Strategies for Achievement" was developed to teach learning and motivation strategies to college students. It involved teaching student four major achievement strategies: take reasonable risk, take responsibility for outcomes, search the environment (for information), and use feedback. Each strategy was divided into tow substrategies, and used to teach students to overcome procrastination, build self-confidence and responsibility, manage their lives, learn from lecture and text, prepare for exams, and write papers. The training was provided as a course taught using a "hybrid" technology-based instructional model called Active Discovery and Participation thru Technology (ADAPT). Students who took the training course earned significantly higher grade point averages in comparison to a matched group, both the term they took the course (with and without course grade included) and the term after taking the course, and were more likely to return for their next year of college. (Contains 41 references.) (Author)

Reproductions supplied by EDRS are the best that can be made
from the original document.

The *Strategies-For-Achievement* Approach For Teaching Study Skills*

Bruce W. Tuckman

The Ohio State University

ED 480 096

Running Title: *Strategies-for-Achievement*

Address: Academic Learning Lab, 1640 Neil Avenue, Columbus OH 43201-2333

Email: tuckman.5@osu.edu

Telephone: 614-688-8284 FAX 614-688-3912

http://ALL.successcenter.ohio-state.edu

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

B. Tuckman

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

*Paper presented at the Annual Meeting of the American Psychological Association, Toronto, 2003 as part of a symposium entitled: Applying Psychological Principles to Teaching Self-Regulation and Learning Strategies.

CG032553

BEST COPY AVAILABLE

The *Strategies-For-Achievement* Approach For Teaching Study Skills

Abstract

An educational psychology-based "study skills" program called *Strategies-for-Achievement* was developed to teach learning and motivation strategies to college students. It involved teaching students four major achievement strategies: take reasonable risk, take responsibility for outcomes, search the environment (for information), and use feedback. Each strategy was divided into two substrategies, and used to teach students to overcome procrastination, build self-confidence and responsibility, manage their lives, learn from lecture and text, prepare for exams, and write papers. The training was provided as a course taught using a "hybrid" technology-based instructional model called **A**ctive **D**iscovery **A**nd **P**articipation thru **T**echnology (ADAPT). Students who took the training course earned significantly higher grade point averages in comparison to a matched group, both the term they took the course (with and without the course grade included) and the term after taking the course, and were more likely to return for their next year of college.

Introduction

Current U.S. retention figures have not improved over time, in spite of large amounts of money expended by colleges and universities on programs and services to retain students. According to recent data, the dropout rate for first-year college students hit a new high. The national freshman-to-sophomore dropout rate had risen to 26.9%; it was 24.5% in 1983. In addition, only 50% of those who enrolled in college earned bachelors degrees and one-third did not complete the first two years (U.S. Department of Education, 1999). The problem is particularly acute among African-American students among whom only about 15% earn baccalaureate degrees.

A very high percentage of students enter college inadequately prepared to face the academic challenge. McCabe (2000) reports that more than one million students nationwide (42% of first-time college-goers) enroll in remedial courses annually. Clearly, lack of preparation is a major factor in college failure.

There is evidence that attrition follows poor grades. Many students tend not to withdraw from courses or drop out of college their when grades are acceptably high. In 1990, the National Center for Student Retention published a study that suggests a strong correlation between grade point averages and persistence in college. Among dropouts, 42% had earned GPAs below 2.0 while only 16% of persisters had performed equally poorly (Schreiner, 1990). However, this is not to discount the fact that a considerable number of students leave college for other than purely academic reasons (Tinto, 1993).

A potential solution to the freshman retention problem may lie in the teaching of study skills. What is the likelihood that teaching study skills will enhance college performance? Regarding *near transfer*, that is, improvement of performances that are

closely related to the training tasks (e.g., are actually part of the training itself) the likelihood is high. Huang (1992), for example, found the effects of teaching students to use self-questioning strategies on achievement of a specific set of materials to be highly successful. Hattie, Biggs, and Purdie (1996) conducted a meta-analysis and report similar success in near transfer across a wide range of such studies, but considerably less success in producing *far transfer*, that is, improvement in performances distantly related to the training tasks (e.g., performance in other situations than the training itself, or at other times).

The current study was undertaken to evaluate a new, psychology-based approach for teaching study skills, called *Strategies-for-Achievement*. Hadwin & Winne (1996) advocate that "institutions should provide means for students to develop adaptable strategies with which to pursue knowledge and solve problems during and after postsecondary experiences" (p. 693) which will contribute to both their abilities and motivation. The impact of being taught this approach was examined in terms of both near and far transfer, as reflected in grade point averages during the term in which the training was received, and in the following term, as well as the subsequent retention of previously at-risk students.

From a psychological perspective, "study skills" refers to the learning and motivation strategies considered essential to being successful in college. Their importance is underscored by the fact that academic tasks at the college level tend to demand far more higher-level thinking and independent learning than those encountered in secondary school (Carson, Chase, Gibson, and Hargove, 1992). A relevant general approach to teaching learning strategies, labeled "learning-to-learn" has its basis in

informational and generative models of learning, and its emphasis on self-regulated and strategic learning (Simpson, Hynd, Nist, and Burrell, 1997). Building on this approach, and the work of Pintrich, McKeachie, and Lin (1987), Weinstein and Underwood (1985), and Dansereau et al. (1979), the work described here features a more integrated and focused approach, using a set of specific strategies and substrategies to cover a variety of learning and motivational tasks.

Strategies-for-Achievement and Related Literature.

This psychological approach for improving students' achievement in college focuses on teaching them learning and motivational strategies, and hence carries a more explicit label then "study skills." It evolved from the achievement motivation model espoused by David McClelland (1965), whose work went on to suggest that the use of strategies such as these increases learners' motivation and subsequent achievement (McClelland, 1979). The original model has been expanded and updated in its application to reflect Garcia and Pintrich's (1994) framework for self-regulation at the college level that includes both a *motivational* and *cognitive* component, and two sources of influence: knowledge and beliefs, and strategies. The four basic strategies for achievement used in the current approach and the two substrategies that accompany each strategy are shown in Figure 1. (The substrategies may be referred to by others as *tactics*; e.g., Hadwin & Winne, 1996.)

The motivational component. The *Strategies-for-Achievement* approach deals with explicit strategies that students can be taught to use for motivating themselves. The *take reasonable risk* strategy represents a contrast, therefore, to the focus on need for achievement or goal orientation as a basis for motivation, As this strategy evolved, it

became seen as an adaptive cyclical process of self-evaluation and reevaluation relative to task difficulty to enable an individual to ascertain and pursue an optimal level of challenge required to achieve mastery (Harter, 1978; Dweck, 1986).

The preference for moderately challenging tasks in the academic environment serves the function of *empowering* individuals toward greater academic achievement by providing them with the diagnostic information necessary for progressively improved performance. This is consistent with Bandura's (1977) concepts of (a) *reciprocal determinism*, the mutually interactive relationship between thoughts, behaviors, and environmental consequences, and (b) *self-efficacy*, ways people can be the agents of their own self-regulation and success, based on the beliefs they have in their own capability. Clearly, goal setting, a prominent self-regulation strategy (Zimmerman, 1998, 2000), and breaking tasks down into sub-tasks, serve as mechanisms for taking reasonable risk.

For example, in the module on procrastination, students are taught to: (a) distinguish between rationalizations for procrastination (e.g., "I work better under pressure") and real reasons (e.g., self-doubt); (b) recognize the thoughts (e.g., "math confuses me"), feelings (e.g., fear) and behaviors (e.g., skipping class) that are provoked by potentially difficult situations (e.g., an impending math midterm); (c) overcome the tendency to procrastinate by using the four major strategies for achievement previously described; and (d) effectively manage their time by creating a "to-do checklist," a self-regulatory procedure that facilitates planning, and incorporates many of the substrategies.

In the module on building self-confidence, the four techniques taught to students that are based on Bandura's (1977, 1986, 1997) four sources of self-efficacy information

are: (a) regulating your emotional level, (b) seeking affirmation, (c) picking the right models, and (d) "just doing it".

In teaching students to use the *take responsibility* strategy, causal explanations and their properties, such as those described in attribution theory (Weiner, 1986, 1995), are used to show students the importance of focusing on effort as the explanation for their outcomes. Perceptions of the *intentionality* of others' actions, based on causal explanations, also factor importantly on taking responsibility, and have been shown to be modifiable by training (Graham, 1997).

The cognitive component. In this domain, the *search the environment* strategy plays a prominent role. For example, Pressley and Wooloshyn (1995) and Mayer (2002) have described techniques for teaching students to use cognitive strategies to acquire and process information, and Mayer (1989) has shown the value of conceptual models for visualizing ways of solving problems. Robinson (1961), and Mayer (1984) relied extensively on the question-asking approach in teaching students to extract meaning from text, and Rosenshine, Meister, and Chapman (1996) reported a meta-analysis showing that teaching students to generate questions resulted in gains in comprehension. Other work has also focused on enhancing students' capability to learn from text by using outlining (e.g., Tuckman, 1993).

Zimmerman (2000) refers to "seeking information," but *search the environment* is taken to have a somewhat broader meaning, one that focuses on question asking as a generic form of information processing. For example, students are taught to view information that is either heard in lectures or read in text as "answers" to implicit questions. By making those questions explicit through the construction of a "Q & A

Outline," students learn both to schematize the information and organize it into visual forms such as diagrams and charts. The outlines and diagrams then help students organize and store their thoughts in long-term memory in preparing for and taking tests, and in writing papers. Sahari, Tuckman, & Fletcher (1996) found that students who were trained to write outlines designed to help them schematize and organize text material demonstrated significantly greater improvement on reading comprehension tests than students not similarly trained. Based on a review of training studies, Hadwin & Winne (1996) "cautiously recommend" self-questioning as an approach that improves student achievement.

The *use feedback* strategy has traditionally focused on external or outcome feedback (Butler and Winne, 1995) which has been found, in general, to result in performance improvement (Kulhavy, 1977; Kulik and Kulik, 1988). More recent emphasis has been on internal feedback, consisting of learner judgment decisions regarding task success relative to multifaceted goals, and productivity of learning strategies relative to expected progress (Butler and Winne, 1995). The *use feedback* strategy subsumes the self-regulating areas of self-monitoring, keeping records, self-evaluation, and self-consequences (Zimmerman, 1998, 2000). Carver and Scheier (1990) and Butler & Winne (1995) see monitoring or the acquisition and use of feedback as the hub of self-regulated cognitive engagement, while Hadwin & Winne (1996) cite monitoring as an approach that "modestly" enhances student achievement.

Problem

The purpose of this study was to evaluate the effectiveness of using the *Strategies-for-Achievement* approach to teach students specific learning and motivation

strategies and substrategies to deal with the intellectual and motivational demands of college. This approach was designed to meet the criterion of going beyond teaching a collection of specific tactics by teaching students how to be strategic in knowing when and how to use them, individually and in concert (Butler and Winne, 1995). Grade point average (GPA), an objective measure of student success, was used as the criterion of program effectiveness.

The research was designed to answer the question: would students taking and completing the *Strategies-for-Achievement* training course earn higher GPAs in the terms during and after the training was received (relative to their prior cumulative GPAs) than a matched group of students who did not take the training course? An additional research question was whether academically at-risk course takers were more likely to return to college the following year than their non-course-taking counterparts. Hadwin & Winne (1996) report that fewer than 3% of the over 500 articles published about study skills and learning strategies "compared students taught a study tactic to other students who studied by whatever methods they might have developed on their own" (p. 711).

Method

Participants

The *Strategies-for-Achievement* approach was taught as a five quarter-hour, credit-bearing, letter-graded elective course to 226 students at a large public, Midwestern university during a school year of three consecutive academic quarters. The demographics of the course takers were as follows: 46% male, 54% female; 51% freshmen, 22% sophomores, 15% juniors, 12% seniors; 68% non-minority, 32% minority. In terms of prior academic performance, the GPA distribution was as follows:

29% under 2.0, 29% between 2.0 and 2.4, 24% between 2.5 and 2.9, 18% 3.0 and over. While this was an elective course, advisors recommended it to students needing learning assistance to facilitate retention or admission into a selective major. Because it was a five-credit course, some of these students, however, could not fit it into their schedules.

A comparison group of 226 students was drawn from student records, such that each student in the no-course group matched a student in the course group on (1) gender, (2) ethnicity, (3) rank (i.e., year in school), and (4) prior cumulative GPA at the time the course-taking student began the course. For new first-quarter freshmen (16% of the total sample), a predicted GPA score based on pre-admission ACT English and mathematics subscores was used in place of actual GPA for matching purposes.

Independent Variable

The independent variable was *instructional condition*: students experiencing the *Strategies-for-Achievement* instruction versus those not receiving it (hereafter referred to as *course versus no course*.) The *course* met 4 1/2 hours per week for 10 weeks (an entire term in the quarter system), and included two introductory modules, four modules on motivation: overcoming procrastination, building self-confidence, taking responsibility, and managing your life, and four on learning/thinking: learning from lecture, learning from text, preparing for exams, and writing papers.

Students used the textbook, *Learning & Motivation Strategies: Your Guide to Success* (Tuckman, Abry, & Smith, 2002), which provided instruction in each area, and included in-class practice activities, and homework assignments for evaluation. After completing each module, students were given a quiz based on module objectives, and at the end of the course, a final exam. There were 10 portolios and five papers, as well as a

large number of learning performance activities mentioned below. All instructional and evaluative components were based on the set of strategies and substrategies previously described (see Figure 1).

Instead of instruction in a traditional class setting, the course was taught using a hybrid, web-based instructional model called **A**ctive **D**iscovery **A**nd **P**articipation thru **T**echnology (ADAPT; Tuckman, 2002). This model for teaching a web-based course in a campus-based computer classroom (i.e., a "hybrid") combines the critical features of traditional classroom instruction (i.e., required attendance, a printed textbook, presence of an instructor) with those of computer-based instruction (i.e., class time spent doing over 200 computer-mediated learning performance activities rather than just two or three exams, self-pacing with milestones rather than a lockstep pattern). Appendix 1 gives examples of in-class performance activities.

The instructional purpose for the multiple learning performance activities was twofold: (1) to provide the practice necessary for changing behavior, and (2) to provide opportunities for transfer. Practice has been shown to be essential in order to enable students to become accustomed to and adept at performing a behavior (Ericeson, 1996). Transfer is much more likely to occur if training is done in the target context (Hattie, Biggs, and Purdie, 1996). The required portfolios and papers presented an opportunity for students to apply the strategies they were learning to other courses, and to the life of a person outside of themselves.

The second level of the independent variable was *no course*. Students in this condition, by virtue of the matching variables, were likely to have course schedules

similar to those of students who took the course, with another elective course in place of the course in which the strategies for achievement were taught.

Dependent Variables

To determine the effect of being taught the strategies for achievement, the following comparisons of grade point averages for students in the course and no course conditions were made: (a) for the course term, i.e., the quarter in which the course was taken (or not taken), with the grade for the course included, (b) for the course term, with the grade for the course excluded; (c) for the follow-up term, i.e., the quarter immediately following the one in which the course was taken (or not taken). In all cases grade point averages were adjusted in terms of students' cumulative grade point averages (or predicted GPAs, in the case of new first quarter freshmen) immediately prior to the term the students took (or did not take) the course. The grading scale (and its numerical equivalents) were as follows: A (4.0), A- (3.7), B+ (3.3), B (3.0), B- (2.7), C+ (2.3), C (2.0), C- (1.7), D+ (1.3), D (1.0), F (0.0).

A fourth dependent variable was retention among academically at-risk students (i.e., those with GPAs under 2.0), measured as percent returning to college for the following academic year. The analysis was limited to this subgroup because students with higher GPAs were relatively much less likely to leave or be forced to leave the university for academic reasons.

Results

Term the Course Was Taken

Two analyses of covariance of GPA were run: (a) GPA with the *course grade included* (a measure of near transfer) and (b) GPA with the *course grade excluded* (a

measure of far transfer). The data from all three quarters were pooled. The SPSS General Linear Equation model was used. In both analyses the dependent variable and covariate were significantly correlated (r=0.44, 0.42 respectively) and the regression lines for each level of the independent variable were parallel, thus justifying the use of ANCOVA.

For quarter GPA with the *course grade included*, a significant main effect for condition (course versus no course) was obtained ($F=68.69$, $df=1/449$, $p<.001$), reflecting significantly better academic performance by course takers than non-takers (see Table 1). Adjusted mean GPAs with the *course grade included* were 2.97 for the course takers versus 2.48 for non-takers, yielding an Effect Size of 0.66. In terms of gain scores, based on course-quarter GPA relative to prior cumulative GPA, students who took the course gained 0.68 GPA points in comparison to 0.20 for non-takers.

Two adjustments of the data were necessary to run the analysis of quarter GPA with the *course grade excluded*. First, it was necessary to remove a course grade from the calculated GPA of non-course-takers, because to do otherwise would be to produce a skewed comparison. The principal reason was that the majority of students took three 5-credit courses, one of which was an elective or non-major course (such as the study skills course) per quarter, and grades in the elective courses were higher. GPAs calculated with all the courses included would predictably be higher than those with an elective course grade removed. This would be compounded by the fact that removal of the course grade unaccompanied by removal of a comparable grade from non-course takers would skew the average number of credits hours being taken by the comparison group, resulting in a smaller sample of grades for course takers than non-takers.

The question then was what grade to remove. Since the course was designed for mastery, despite its demanding work requirements its grade was typically the highest earned by students taking it. That would suggest removing the highest course grade for non-takers. However, given the desire to make the most conservative choice possible, the decision was made to remove the grade closest to, but above, the average grade actually obtained by non-course takers. Since non-takers earned a mean GPA of 2.48, which falls between a B- and a C+, the equivalent of a B- grade for 5 credits was removed from their GPA calculation.

Second, to avoid GPA calculations based on an insufficient number of credits, those in either group whose credit hours with a course grade removed fell below 10 were removed from the sample. This resulted in the elimination of nine students from each condition (or 4% of the total sample).

For quarter GPA with the *course grade excluded*, a significant main effect for condition (course versus no course) was obtained ($F=7.29$, $df=1/431$, $p<.01$), reflecting significantly better academic performance by course takers than non-takers (see Table 1). Adjusted mean GPAs with the *course grade excluded* were 2.63 for the course takers versus 2.36 for non-takers, yielding an Effect Size of 0.34. In terms of gain scores based on course-quarter GPA relative to prior cumulative GPA, students who took the course gained 0.35 GPA points in comparison to 0.08 for non-takers.

Term Following

Since the course grade was no longer a factor in the following term's GPA, a single analysis of covariance was run of quarter GPA by condition: course versus no course, with cumulative GPA (the same one used in the two prior analyses) as the

covariate. The data from all three quarters were pooled. The SPSS General Linear Equation model was used. The dependent variable and covariate were significantly correlated (r=0.41), and the regression lines for each level of the independent variable were parallel, thus justifying the use of ANCOVA.

The N for each condition was smaller than in the previous analyses. Both the course-taker group and the non-course-taker group lost 14 students from the previous quarter. Eight of the 14 from the non-taker group either withdrew from school or were dismissed, while all 14 from the course-taker group were eligible to but chose not to enroll that quarter.

A significant main effect for condition (course versus no course) was obtained ($F=3.78$, $df=1/421$, $p<.04$), reflecting significantly better academic performance the *term following* by course takers than non-takers (see Table 1). Course takers earned an adjusted mean GPA of 2.46 in contrast to the adjusted mean of 2.27 earned by the non-course takers, which yielded an Effect Size of 0.19. In terms of gain scores, based on course-quarter GPA relative to prior cumulative GPA, course takers gained 0.18 GPA points in comparison to -0.01 for non-course takers.

Retention

Retention rate, that is, percent returning for their next year of college, was compared for course takers and matched non-takers (excluding graduating seniors) with prior cumulative GPAs below 2.0. This cutoff was used because it separated out students classified as academically at-risk, and hence most in danger of dropping out, from those not so classified. Results showed that 77% of the 66 at-risk course takers returned in

comparison to 63% of the 66 non-takers. This distribution yielded a chi-square value of 3.67 (df=1, p=.06).

Discussion

Summary of Results

Students who completed the *Strategies-for Achievement* training course earned significantly higher GPAs (+ 0.48) for the term in which the course was taken, when their GPAs included the grade for the course. This effect can be judged to reflect near transfer of strategies for which training was provided, since the students had to demonstrate their mastery of what they were learning in the course. Since the grade for the course was based on performance on over 200 learning activities (e.g., assignments, tests, portfolios, papers), each of which reflected mastery of the strategies being taught, and had clear evaluation criteria, the course grade can be seen as an indication of near transfer. Had the majority of the students in the course not demonstrated mastery, however, the validity of the strategies and the quality of the training would have been suspect.

To examine far transfer of the strategies for achievement, it was necessary to examine academic performance in other courses, both those taken simultaneously to the course and those taken subsequently. Determining the effect on courses taken simultaneously is difficult, since all students are not taking the same courses. Moreover, to remove high grades from one group and not the other leaves an imbalance in terms of representativeness of the result. To make the fairest comparison, the most representative grade (a B-) was removed from the GPAs of non-course takers, a conservative procedure since 75% of the course takers earned A or A- grades in the course, and that grade was removed from their GPAs for this analysis. The resulting comparison still significantly

favored the students trained to use the *Strategies-for-Achievement* approach, clearly reflecting far transfer, at least to other courses that were taken at the same time. However the GPA difference was not as great (0.27) as with the grade included (0.48).

The analysis of GPA for the follow-up quarter clearly reflects far transfer rather than a direct effect, or possibly bias, of the *Strategies-for-Achievement* course grade. The reliable 0.19 difference in GPA in favor of students taking the course demonstrates a continued benefit of the *Strategies-for-Achievement* training on academic performance, and leads one to hypothesize that the students continued to use the strategies beyond the training period.

Contribution of Technology

As for the contribution of the technology to the overall effect, Tuckman (2002) has demonstrated that while it does add significantly to the effectiveness, traditional teaching of the course also produces academic performance superior to that of matched "controls." In other words, those taking the course without technology were found to fall in-between those taking with technology and the controls, with the differences being significant.

Methodological Issues

Using students' grade point averages, rather than subjective self-estimates, as a yardstick for evaluating study skills intervention programs is demanding, given the many variables, both dispositional and environmental, that may affect students' performance. Nevertheless, many important decisions influencing a student's future are made on the basis of GPA. Therefore, GPA would seem to be a very significant, if challenging, criterion for evaluating such programs. Causing changes in students' GPAs would suggest that an

intervention program was sufficiently influential to outweigh or overcome uncontrollable variables.

The internal validity of the present design is susceptible to bias introduced by uncontrolled variables. In situations such as this one, where random assignment of students to conditions is impossible without seriously compromising external validity, it becomes necessary to compare intact groups. In the study of outcomes that reflect motivation, internal and external validity must be pitted against one another. Studying real student behavior with real consequences reveals true motivation well beyond that which can be uncovered through simulation. It also requires that students be given the choice to participate which raises the possibility of self-selection bias or the "volunteer effect," whereby more motivated students elect to take the course. Controlling potentially relevant demographic variables and pretest scores, as was done in this study, represents a reasonable, but not perfect, technique for finding out what will "work" in the real world.

To provide some basis for evaluating the possibly biasing volunteer effect, a *post hoc* comparison was made using data for a single academic quarter, namely winter. In addition to the course takers and matched non-course takers, a third group was included, namely students who did not take the course in the winter, but did take it the following spring. These students can be considered motivationally similar to the course takers because they subsequently "volunteered" to take the course themselves. Results of a one-way ANOVA of quarter GPAs for the three groups resulted in a significant F-ratio of 28.63 ($df=2/227$, $p<.001$), with both comparison groups earning significantly lower GPAs (2.49 and 2.47 respectively than the course takers (2.98). For the quarter GPA without the course grade included, a significant F-ratio of 11.46 ($df=1/227$, $p<.001$) was

obtained, with both comparison groups again earning lower GPAs (2.00 and 2.19 respectively) than the course takers (2.69). These findings suggest that the demonstrated effect of the strategy training course is not based on sampling bias.

Conclusion

The obtained effect of the psychology-based *Strategies-for-Achievement* course on students' academic success indicates that psychological principles and theories about achievement motivation, self-regulation, and information processing can be applied to the challenge of being a successful student. Tuckman (1999) theorized that the three critical requirements for achievement were the right attitudes, drive, and strategies. As the name implies, the *Strategies-for-Achievement* approach focused on the third, the one most likely amenable to change. The fact that the approach resulted in significantly higher achievement for those students experiencing it compared to matched "controls" does not specifically indicate which of the strategies were adopted and to what extent. That remains for further research to uncover.

References

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*, 191-215.

Bandura, A. (1986). *Social foundations of thought and action*. Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.

Butler, D.L. & Winne, P.H. (1995). Feedback and self-regulated learning: A theoretical synthesis. *Review of Educational Research, 65*(3), 245-281.

Carson, J. G., Chase, J. D., Gibson, S. U., & Hargrove, M. F. (1992). Literacy demands of the undergraduate curriculum. *Reading Research Instruction, 31*, 25-50.

Carver, C.S. & Scheier, M.F. (1990). Origins and functions of positive and negative affect: A control-process view. *Psychological Review, 97*, 19-35.

Dansereau, D. F., Collins, K. W., McDonald, B. A., Holley, C. D., Garland, J., Diekhoff, G., & Evans, S. H. (1979). *Development and evaluation of a learning strategy training program. Journal of Educational Psychology, 71*, 623-659.

Dweck, C.S. (1986). Motivational processes affecting learning. *American Psychologist, 41*, 1040-1048.

Ericcson, K.A. (1996). *The road to excellence: The acquisition of expert performance in the arts, sciences, sports, and games*. Mahwah, NJ: Erlbaum.

Garcia, T., & Pintrich, P. R. (1994). Regulating motivation and cognition in the classroom: The role of self-schemas and self-regulatory strategies. In D. Schunk & B. J. Zimmerman (Eds.), *Self-regulation of learning and performance*. Hillsdale, N.J.: Erlbaum.

Graham, S. (1997). Using attribution theory to understand social and academic motivation in African American youth. *Educational Psychologist, 32*, 21-34.

Hadwin, A.F. & Winne, P.H. (1996). Study strategies have meager support: A review with recommendations for implementation. *Journal of Higher Education, 67*(6), 692-715.

Harter, S. (1978). Effectance motivation reconsidered: Toward a developmental model. *Human Development, 21*, 34-64.

Hattie, J., Biggs, J., & Purdie, N. (1996). Effects of learning skills interventions on student learning: A meta-analysis. *Review of Educational Research, 66*, 99-136.

Huang, Z. (1992). A meta-analysis of student self-questioning strategies. *Dissertation Abstracts International, 52*(11). 3874A.

Kulhavy, R.W. (1977). Feedback in written instruction. *Review of Educational Research, 47*(1), 211-232.

Kulik, J.A., & Kulik, C.-L.C. (1988). Timing of feedback and verbal learning. *Review of Educational Research, 58*(1), 79-97.

Mayer, R.E. (1984). Aids to text comprehension. *Educational Psychologist, 19*, 30-42.

Mayer, R.E. (1989). Models for understanding. *Review of Educational Research, 59*, 43-64.

Mayer, R.E. (2002). The *promise of educational psychology*. Vol. II: *Teaching for meaningful learning*. Upper Saddle River, NJ: Prentice Hall.

McCabe, R.H. (2000). *No one to waste: A report to public decision-makers and community college leaders*. Washington, D.C.: Community College Press.

McClelland, D. C. (1965). Toward a theory of motive acquisition. *American*

Psychologist, *20*, 321-333.

McClelland, D. C. (1979). *Increasing achievement motivation*. Boston: McBer & Co.

Pintrich, P. R., McKeachie, W. J., & Lin, Y. G. (1987). Teaching a course in learning to learn. *Teaching Psychology*, *14*, 81-86.

Pressley, M. & Wooloshyn, V. (1995). *Cognitive strategy instruction that really improves children's academic performance* (2nd ed.). Cambridge, MA: Brookline Books.

Robinson, F. P. (1961). *Effective study*. NY: Harper & Row.

Rosenshine, B., Meister, C., & Chapman, S. (1966). Teaching students to generate questions: A review of the intervention studies. *Review of Educational Research*, *66*, 181-221.

Sahari, M., Tuckman, B.W., & Fletcher, H.J. (1996). The effect of constructing coded elaborative outlines and student generated questions on text learning. *Curriculum Forum*, *6*, 48-59.

Schreiner, L.A. (1990). *The College Student Inventory: Accurately identifying students at risk*. Iowa City, IA: Noel/Levitz National Center for Student Retention.

Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed.). Chicago: University of Chicago Press.

Simpson, M. L., Hynd, C. R., Nist, S. L., & Burrell, K. I. (1997). College assistance programs and practices. *Educational Psychology Review*, *9*, 39-87.

Tuckman, B. W. (1993). The coded elaborative outline as a strategy to help students learn from text. *Journal of Experimental Education*, *62*, 5-13.

Tuckman, B.W. (1999). A tripartite model of motivation for achievement: Attitude/Drive/Strategy. Paper presented at the Annual Meeting of the American Psychological Association, Boston, MA.

Tuckman, B.W. (2002). Evaluating ADAPT: A hybrid instructional model combining web-based and classroom components. *Computers & Education, 39*, 261-269.

Tuckman, B. W., Abry, D., & Smith, D. R. (2002). *Learning and motivation: Your guide to success*. Upper Saddle River, NJ: Prentice Hall.

U.S. Department of Education (1999). Student effort and academic progress. Wash, DC: Government Printing Office.

Weiner, B. (1986). *An attributional theory of motivation and emotion*. N.Y.: Springer-Verlag.

Weiner, B. (1995). *Judgments of responsibility: A foundation for a theory of social conduct*. N.Y.: Guilford.

Weinstein, C. E., & Underwood, V. L. (1985). Learning strategies: The how of learning. In J. W. Segal & R. Glaser (Vol. Eds.), *Thinking and learning skills* (Vol. 1, pp. 315-327). Hillsdale, N.J.: Erlbaum.

Zimmerman, B.J. (1998). Academic studying and the development of personal skill: A self-regulatory perspective. *Educational Psychologist, 33*, 73-86.

Zimmerman, B.J. (2000). Attaining self-regulation: A social-cognitive perspective. In M. Boekaerts & P.R. Pintrich (Eds.). *Handbook of self-regulation*. New York: Academic Press, pp. 13-39.

Table 1

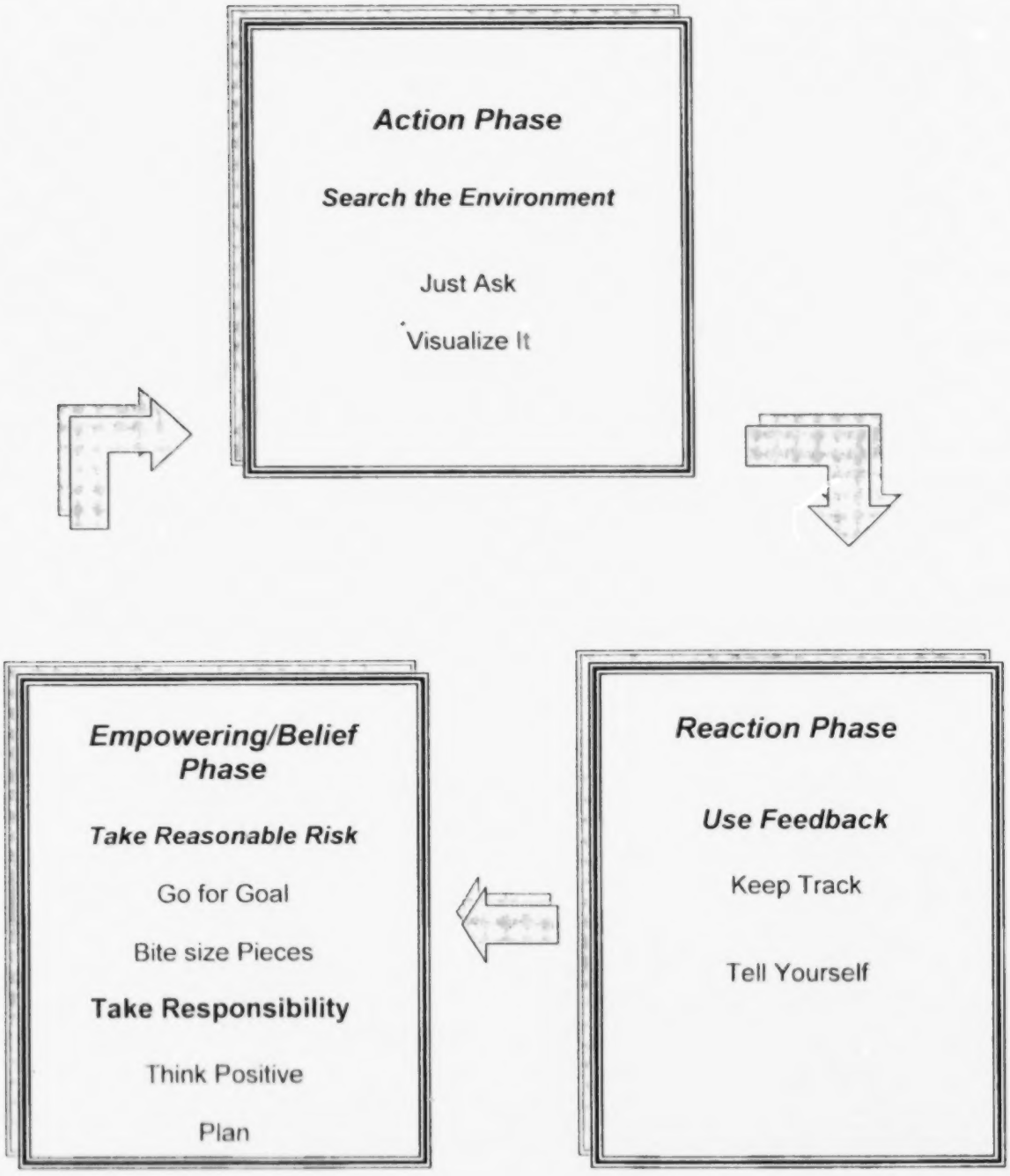
Results of the Three ANCOVAs of GPA Scores for Course Takers and Non-takers

	ADJUSTED MEAN GPA			
	Course Takers	Non-Takers	F	df
Same Quarter: Course Grade Included	2.97	2.48	68.69***	1/449
Same Quarter: Course Grade Excluded	2.63	2.36	7.29**	1/431
Next Quarter	2.46	2.27	3.78*	1/421

* $p < .05$, ** $p < .01$, *** $p < .001$

Figure 1

STRATEGIES FOR ACHIEVEMENT



Appendix

Some Examples of the 216 Learning Performance Activities (Tuckman et al., 2002)

QUICK-PRACTICE from Managing Your Life

It's a Saturday night. You're out drinking with your friends. You've already had a few rounds, when one of your friends says it's time for another round. You realize that you've already had as much as you can handle, so you tell them you've had enough and are going home. They start trying to convince you, then start calling you names. You think, "What a sorry bunch of jerks!" and split.

Identify instances of PERSON, BEHAVIOR, and ENVIRONMENT, using the self-system, and write them in the order that indicates the sequence of events.
("Model answer" provided after submission)

APPLICATION from Overcoming Procrastination

Pick one of the rationalizations for procrastinating listed in Self-Survey 3.2, and write a short scenario that illustrates the rationalization. A scenario is a clear example of the idea in real life action. It should be at least one complete paragraph, and should include:

Who is involved (preferably you; otherwise change the names to protect the "innocent.")?

What is the situation?

What is the rationalization being used?

ASSIGNMENT from Learning From Text

Read the following article entitled Race and the Schooling of Black Americans(a new browser will open for you with the reading), and construct a Question and Answer (Q&A) Outline related to the article. Include and label all three kinds of questions: Recap (RC), Reflection (RF), and Reasoning (RS).

PORTFOLIO from Preparing For Exams

Using your book, notes, and the Q&A Outline for one of your other courses that you created for the Module 7 Portfolio, create a 5-question mock multiple-choice exam. Also, construct a CC Web Chart that covers all of the information necessary to answer each of the questions. Remember, you can predict questions first and then create a CC Web Chart, or you can create your CC Web Chart first, and then predict questions.

Next, using the same materials, create a two-question mock essay exam. Then, for each essay question, construct a Skeleton Key Diagram that will cover all of the information necessary to answer the question.

BEST COPY AVAILABLE

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

REPRODUCTION RELEASE

(Specific Document)

I. DOCUMENT IDENTIFICATION:

Title:	The **Strategies-For-Achievement** Approach For Teaching Study Skills
Author(s):	Bruce W. Tuckman
Corporate Source:	The Ohio State University
Publication Date:	

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, *Resources in Education* (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic media, and sold through the ERIC Document Reproduction Service (EDRS). Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to each document.

If permission is granted to reproduce and disseminate the identified documents, please CHECK ONE of the following three options and sign at the bottom of the page.

The sample sticker shown below will be affixed to all Level 1 documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

_____

_____

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

Level 1 ☑

Check here for Level 1 release, permitting reproduction and dissemination in microfiche or other ERIC archival media (e.g., electronic) *and* paper copy

The sample sticker shown below will be affixed to all Level 2A documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE, AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY, HAS BEEN GRANTED BY

_____

_____

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2A

Level 2A ☐

Check here for Level 2A release, permitting reproduction and dissemination in microfiche and in electronic media for ERIC archival collection subscribers only

The sample sticker shown below will be affixed to all Level 2B documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

_____

_____

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2B

Level 2B ☐

Check here for Level 2B release, permitting reproduction and dissemination in microfiche only

Documents will be processed as indicated provided reproduction quality permits.
If permission to reproduce is granted, but no box is checked, documents will be processed at Level 1.

I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate these documents as indicated above. Reproduction from the ERIC microfiche or electronic media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries.

Sign here, → please

Signature: Bruce W. Tuckman	Printed Name/Position/Title: Bruce W. Tuckman, Professor & Director	
Organization/Address: Academic Learning Lab 250B, 1640 Neil Ave., Columbus, OH 43201	Telephone: 614-688-8284	FAX: 614-688-3912
	E-Mail Address: tuckman.5@osu.edu	Date: 9-30-03

III. DOCUMENT AVAILABILITY INFORMATION (FROM NON-ERIC SOURCE):

If permission to reproduce is not granted to ERIC, *or*, if you wish ERIC to cite the availability of these documents from another source, please provide the following information regarding the availability of these documents. (ERIC will not announce a document unless it is publicly available, and a dependable source can be specified. Contributors should also be aware that ERIC selection criteria are significantly more stringent for documents that cannot be made available through EDRS.)

Publisher/Distributor:
Address:
Price:

IV. REFERRAL OF ERIC TO COPYRIGHT/REPRODUCTION RIGHTS HOLDER:

If the right to grant this reproduction release is held by someone other than the addressee, please provide the appropriate name and address:

Name:
Address:

V. WHERE TO SEND THIS FORM:

Send this form to the following ERIC Clearinghouse:

ERIC Counseling & Student Services
University of North Carolina at Greensboro
201 Ferguson Building
PO Box 26171
Greensboro, NC 27402-6171